

**Amendments to the Drawings** include an attached new sheet;

The attached new drawing sheet adds Fig. 1.

Attachment: New Fig. 1

## **REMARKS**

Claims 1-23 are pending in this application. By this Amendment, claims 1 and 6-8 have been amended to rephrase the ratios as requested by the Patent Office.

The courtesies extended to Applicants' representative by Examiner Singh at the interview held on November 10, 2005, are appreciated. The reasons presented at the interview as warranting favorable action are incorporated into the remarks below and constitute Applicants' record of the interview.

### **I. Amendment to the Drawings**

During the November 10 interview, the Examiner requested Applicants to provide a drawing to show the featured elements as recited in claim 1. Thus, Fig. 1 has been added at the request of the Examiner.

No new matter is added by adding Fig.1 to the specification. Fig. 1 is supported in the original specification, for example in paragraph [0008], describing a penetration-resistant material comprising at least a double layer of woven fabric wherein the double layer comprises a first layer of fabric composed of a first set of threads and a second set of threads with the second set of threads being transverse to the first set of threads, and a second layer of fabric composed of a first set of threads and a second set of threads with the second set of threads being transverse to the first set of threads, and wherein the first and second sets of threads of the first layer have a parallel orientation towards the first and second sets, respectively, of threads of the second layer.

### **II. Claim Objections**

Claims 1-23 were objected to because of an alleged informality. Specifically, claim 1 was objected to because the recitation "a penetration-resistant material comprising at least a double layer of woven fabric...the double layer comprises a first layer...and a second layer..." is allegedly unclear. The Patent Office suggested amending this language to "a

composite comprising a first and a second layer...". However, such an amendment does not clearly describe the claimed subject matter recited in claim 1.

As discussed during the November 10 interview and as shown in attached Fig.1, Claim 1 is directed to a penetration-resistant material that comprises at least a double layer, and the double layer is further comprised of a first layer and a second layer. The two layers of the double layer do not comprise a composite as suggested by the Examiner. Applicants submit that the present language is clear, and that revising to the term "composite" makes the claim less clear.

Thus, Applicants submit that the language of claim 1 does not need to be clarified. Therefore, Applicants respectfully request the Patent Office to withdraw this objection.

## **II. Rejections Under 35 U.S.C. §112, Second Paragraph**

Claims 1-23 were rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite. This rejection is respectfully traversed.

The ratios recited in claims 1-23 were allegedly in improper form. In order to expedite resolution of this issue, Applicants have amended the ratios recited in claims 1 and 6-8 to compare two factors, for example, 1:1, 4.2:1, or 5.9:1. Therefore, Applicants submit that this rejection is moot.

Further, the Patent Office asserts that the total weight of the first and second layers of fabric would add up to 130% because the first layer has a fabric weight of at least 65% and the second layer has a fabric weight of at least 65%. This characterization is incorrect. As recited in the claims, and as discussed during the November 10 interview, each fabric layer has its own separate fabric weight of 100%. Thus, the first set of threads of the first fabric layer is recited to comprise at least 65% of the first layer fabric weight, and the second set of threads of the second fabric layer is recited to comprise at least 65% of the second layer fabric weight. The percentages are thus recited with respect to threads of each layer, not with

respect to the fabric layer weight in the overall double layer. Thus, Applicants submit that claim 1 is clear and definite as written.

For all the foregoing reasons, reconsideration and withdrawal of the rejection are respectfully requested.

### **III. Rejections Under 35 U.S.C. §103(a)**

Claims 1-23 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over WO 00/42246 ("WO '246") in view of U.S. Patent No. 5,471,906 ("Bachner") and further in view of WO 92/01108 ("WO '108"). This rejection is respectfully traversed.

WO '246 concerns a penetration-resistant material comprising at least a double layer of fabric comprised of two layers of woven fabric. Both layers of woven fabric consist of a first set of threads with 3.5 to 20 threads/cm and a linear density of at least 420 dtex and a second set of threads with 0.5 to 8 threads/cm and a linear density of at least 50 dtex. The second set of threads are transverse to the first set of threads. In the double layer, the two layers of woven fabric are cross-plied at an angle. See the Abstract and claim 1 of WO '246.

As generally known, a woven fabric consisting of two sets of threads being transverse has one set of threads in the warp direction and the other set of threads in the weft direction. According to WO '246, the threads with the higher linear density, for example the first set of threads having a linear density of at least 420 dtex, are preferably the warp threads (see claim 9 and the Examples), and thus the second set of threads must be the weft threads.

Thus, according to WO '246, the threads with a linear density of at least 420 dtex are the warp threads in both layers of the double layer of fabric. The threads of the weft threads are also identical in both layers of the double layer. The two woven fabric layers forming the double layer of WO '246 are thus identical due to the identical use of the same warp and weft threads in each layer.

In contrast to WO '246, according to the invention as recited in claim 1, each woven fabric is composed of two sets of threads, the set of threads with a linear density of at least 210 dtex forming the first set of threads in the first layer and the second set of threads in the second layer.

The first and second sets of threads of the first layer have a parallel orientation towards the first and second sets of threads, respectively, of the second layer. Thus, in claim 1, and as discussed during the November 10 interview, the two layers of woven fabric are not cross-plied at an angle.

The two layers of fabric forming the double layer of material recited in claim 1 are woven fabric layers. The first set of threads having a linear density of at least 210 dtex forms the warp thread of the first layer and the second set of threads having a linear density of at least 50 dtex forms the weft thread of the first layer, while in the second woven fabric layer the first set of threads having a linear density of at least 50 dtex is the warp thread and the second set of threads having a linear density of at least 210 dtex is the weft thread.

The set of threads forming the warp thread in the first layer must be the weft thread in the second layer, and the set of threads forming the weft thread in the first layer must be the warp thread of the second layer. The woven fabric layers forming the one double layer as recited in claim 1 are thus not identical due to the different orientation of threads in each layer.

However, WO '246 does not teach that the first set of threads of the first fabric layer must be the second set of threads of the second fabric layer, and that the second set of threads of the first fabric layer must be the first set of threads of the second fabric layer as recited in claim 1. Instead, WO '246 teaches that the threads of the first layer have an identical orientation in the second layer, with the weft threads being the same in the first and second layers. This differs from the elements recited in claim 1.

The Patent Office further alleges that one of ordinary skill in the art would have duplicated and rearranged the fabric of WO '246, motivated by the desire to create a fabric having increased and enhanced ballistic resistance. But, the present application is not a result of a duplication and rearrangement of fabrics of WO '246, but combines two differently woven fabrics.

If one produces a double layer of woven fabric according to WO '246 from two identical woven fabrics which have been cross-plied at an angle, it is unavoidable that each second woven fabric layer must be cut in length such that its length corresponds to the width of the first woven fabric layer. This means that in order to produce the double layer of WO '246, each second layer must be cut in order to lay the second layer at an angle on the first layer. Therefore, the manufacturing of the double layer of WO '246 takes very great effort.

The manufacture of the layer of claim 1 made up of two different woven fabrics is much easier to manufacture than a double layer of WO '246 because it is not necessary to lay the two different woven fabrics one upon the other. Thus, there is no cutting in length and cross-plying necessary, and therefore one can produce the claimed layer continuously and in endless length.

In addition to the production drawback, the penetration-resistant material of WO '246 also contains weak points negatively influencing its ballistic performance. If the first layer is a continuous layer where a first piece of the second woven fabric layer is laid open after having been cut to a length that corresponds to the width of the first woven fabric, the second piece of the second woven fabric layer has to be located adjacent to the first piece on the first layer of woven fabric. Thus, it is unavoidable that between the first and second pieces of the second woven fabric layer laid upon the first layer of woven fabric, a small gap will remain which is not continuously covered by the threads of the second woven fabric. The

penetration-resistant material of claim 1 overcomes this disadvantage of the material of WO '246.

Thus, WO '246 fails to teach or suggest the recited elements of claim 1. In addition, the disclosure of WO '246 does not motivate one of ordinary skill in the art to avoid cross-plying of the two fabric layers in order to avoid weak points negatively influencing the penetration resistance. WO '246 specifically requires cross-plying, and thus teaches away from claim 1.

The Patent Office admits that WO '246 does not teach or suggest the waterproofing factor as required by claim 1. However, the Patent Office relies on Bachner as allegedly teaching an improved ballistic armor by applying a waterproof coating to the composite and thereby improving the breathability and flexibility of the armor. However, even if Bachner were to have been combined with WO '246 as alleged by the Patent Office, the presently claimed subject matter still would not have been achieved because Bachner fails to remedy the extensive deficiencies of WO '246 discussed above.

Moreover, as discussed during the November 10 interview, Bachner does not teach treating sets of threads of a double layer of woven fabric with a water-repellant. Nowhere in Bachner are sets of threads taught as recited in claim 1. In fact, Bachner teaches that the armor layer need not be treated with a water-repellant because the armor layer can be effectively sealed with a separate waterproof cover. See Bachner, column 2, lines 36-48. Thus, Bachner does not teach or suggest threads treated with a water-repellant as recited in claim 1. The combined teachings of WO '246 and Bachner fails to teach or suggest claim 1 for this additional reason.

Thus, Applicants respectfully submit that WO '246 and Bachner, alone or in combination, would not have led one of ordinary skill in the art to claim 1 and the claims dependent therefrom.

The Patent Office further turns to WO '108 as allegedly teaching applying a fluoroacrylate to an aramid fiber. However, even if combined, WO '108 still does not remedy the fabric orientation deficiencies of WO '246 discussed extensively above.

Moreover, WO '108 also would not have suggested a water-repellant treatment for the threads in WO '246. WO '108 teaches a method for improving hydrolytic resistance of aramid fiber by coating the fiber with a special aqueous fluoropolymer dispersion. Hydrolytic resistance here is resistance against an alkaline media such as NaOH. The aim of WO '108 is to improve the resistance against alkaline media by applying the fluoropolymer dispersion, which results in an increase in tenacity retention. See WO '108, page 8, Table I.

WO '108 thus merely indicates fibers may be treated for alkaline resistance, and WO '108 is completely silent with respect to ballistic properties. As such, one of ordinary skill in the art would not have been led by WO '108 to have included the treated fibers in a ballistic resistant fabric. Ballistic resistant fabrics rarely need alkaline resistance, and WO '108 indicates no other possible benefits with respect to ballistic resistant fabrics. Thus, WO '108 could not have led one to modify WO '246 as needed to achieve claim 1 and the claims dependent therefrom.

For the foregoing reasons, Applicants respectfully submit that WO '246, Bachner and WO '108, alone or in combination, would not have led one of ordinary skill in the art to claim 1 and claims dependent therefrom.

Reconsideration and withdrawal of this rejection are thus respectfully requested.

**IV. Obviousness-Type Double Patenting Rejection Over  
Co-pending Application No. 10/471,089**

Claims 1-23 were rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over the claims of co-pending Application No. 10/471,089 and over the claims in U.S. Patent No. 6,662,369, U.S. Patent No. 6,610,618



and U.S. Patent No. 6,890,871, each in view of Bachner or WO '108. This rejection is respectfully traversed.

The Patent Office asserts that the claims of the present application and the claims of co-pending Application No. 10/471,089 are not patentably distinct from each other because they all appear to be obvious variants of one another even though they are not identical. Applicants respectfully disagree.

Application No. 10/471,089 claims a penetration-resistant material comprising at least a double layer of woven fabric, a penetration-resistant material comprising at least a double layer of woven fabric, characterized in that the double layer comprises a first layer of fabric composed of a first set of threads comprising 3.5 to 20 threads/cm, having a linear density of at least 210 dtex, and comprising at least 65% of the fabric weight, and a second set of threads comprising 0.5 to 16 threads/cm and having a linear density of at least 50 dtex, with the second set of threads being transverse to the first set of threads, and the ratio of the number of threads/cm of the first set to that of the second set is greater than 1:1, and a second layer of fabric composed of a first set of threads comprising 0.5 to 16 threads/cm and having a linear density of at least 50 dtex, and a second set of threads comprising 3.5 to 20 threads/cm, having a linear density of at least 210 dtex, and comprising at least 65% of the fabric weight, with the second set of threads being transverse to the first set of threads, and the ratio of the number of threads/cm of the second set to that of the first set is greater than 1:1, and wherein the first and second sets of threads of the first layer have a parallel orientation towards the first and second sets, respectively, of threads of the second layer.

Nowhere do the claims in Application No. 10/471,089 teach or suggest threads in the first layer of fabric and threads in the second layer of fabric are treated with a water-repellant as recited in present claim 1. Additionally, nowhere in the claims of Application No. 10/471,089 is it taught or suggested that a water-repellant composition as recited in claims 3-

5 may be used. Thus, nothing in the claims of Application No. 10/471,089 would have suggested this specific feature of a water-repellant as recited in the present claims. Therefore, Application No. 10/471,089 would not have led one of ordinary skill in the art to claim 1 and the claims dependent therefrom.

In addition, none of the claims in U.S. Patent No. 6,610,618 and U.S. Patent No. 6,890,871 teach or suggest a water-repellant and/or treating sets of threads of a double layer of woven fabric with a water-repellant. Thus, the present application is patentably distinct over the claims of these U.S. Patents as well.

Furthermore, U.S. Patent No. 6,662,369 claims a stab-resistant material comprising at least more than one laminate consisting of two woven fabrics laminated together with a polymer film such that two woven fabrics are joined via the polymer film, wherein the fabrics comprise yarns having a tensile strength of at least 900 MPA, and the polymer film joining the fabrics has a tensile strength of at least 10 MPA and a flexural modulus of 1500 to 4500 MPA. Clearly, the claims of U.S. Patent No. 6,662,369 do not teach or suggest that each woven fabric layer is composed of two sets of threads as recited in claim 1. In addition, none of the claims in U.S. Patent No. 6,662,369 teach or suggest treating the sets of threads with a water-repellant. Thus, the present application is also patentably distinct over U.S. Patent No. 6,662,369.

In addition, the Patent Office asserts that it would be obvious for a skilled artisan to add the water-repellant coating as recited in claim 1 because Bachner teaches the use of a waterproof coating on body armor. Applicants respectfully disagree. As discussed above, Bachner teaches sealing the armor layer within a waterproof cover. Bachner does not teach treating sets of threads of a double layer of woven fabric with a water-repellant. Thus, the present claims are not obvious variants of the claims in the U.S. application and patents in view of Bachner, and are patentably distinct thereover.

Moreover, the Patent Office asserts that WO '108 teaches the use of fluoroacrylates in waterproof coatings. However, as discussed extensively above, using fluoroacrylates to improve resistance against an alkaline media such as NaOH as in WO '108 would not have suggested applying a water-repellant to threads of a ballistic resistant fabric. Thus, the present claims are not obvious variants of the claims in the Application No. 10/471,089 and patents in view of WO '108, and are patentably distinct thereover.

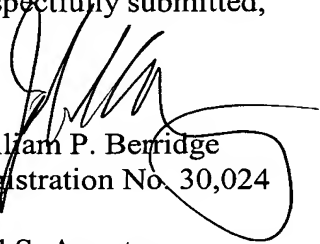
For all the foregoing reasons, reconsideration and withdrawal of this provisional rejection are respectfully requested.

**V. Conclusion**

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-23 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachments:

New Sheet Fig. 1

Date: December 8, 2005

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